FIG. 1

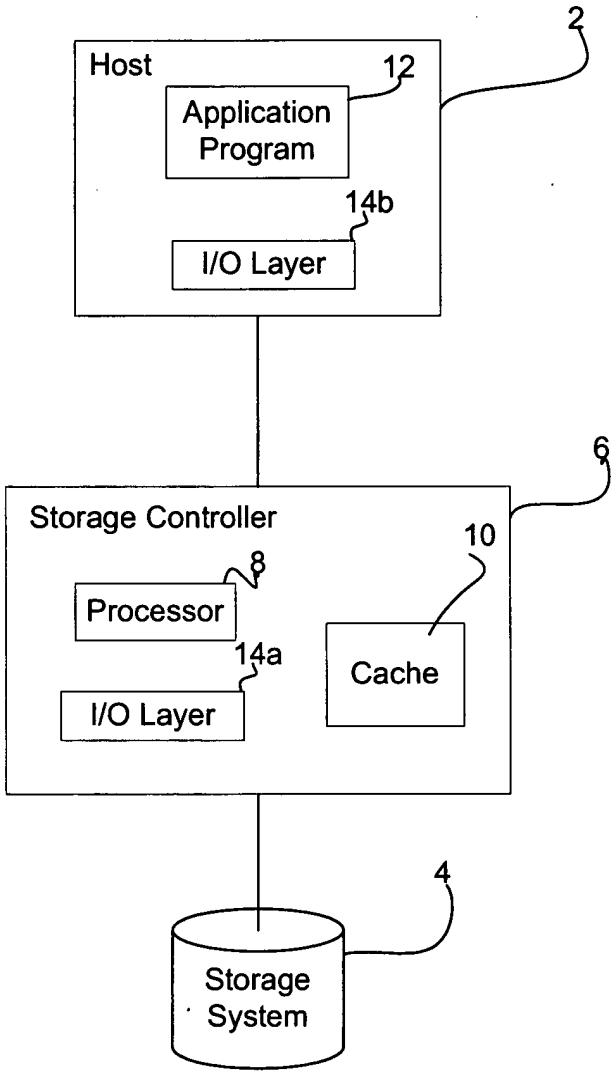

2
Host
12
Application Program
14b
I/O Layer
6
Storage Controller
10
8
Processor
14a
I/O Layer
Cache
4
Storage System

FIG. 2

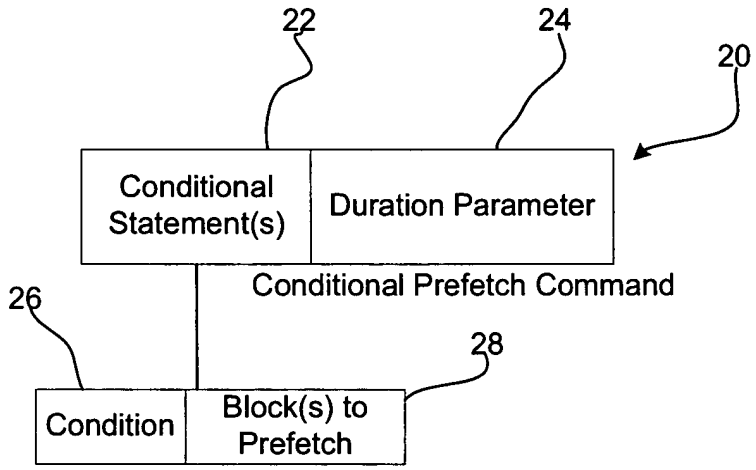

22
24
20
Conditional Statement(s)
Duration Parameter
Conditional Prefetch Command
26
28
Condition
Block(s) to Prefetch

FIG. 3

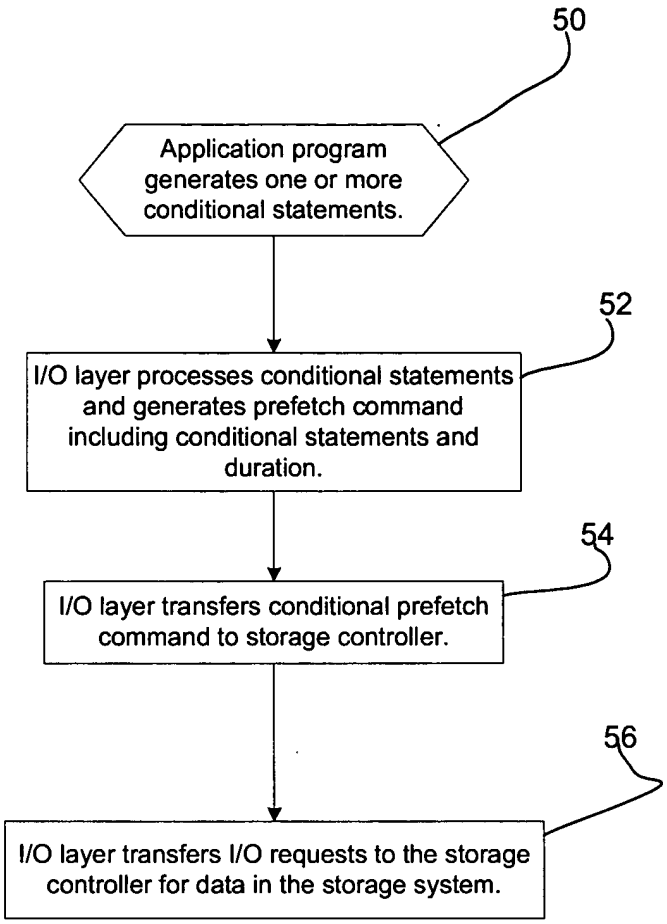

50
Application program generates one or more conditional statements.
52
I/O layer processes conditional statements and generates prefetch command including conditional statements and duration.
54
I/O layer transfers conditional prefetch command to storage controller.
56
I/O layer transfers I/O requests to the storage controller for data in the storage system.

FIG. 4

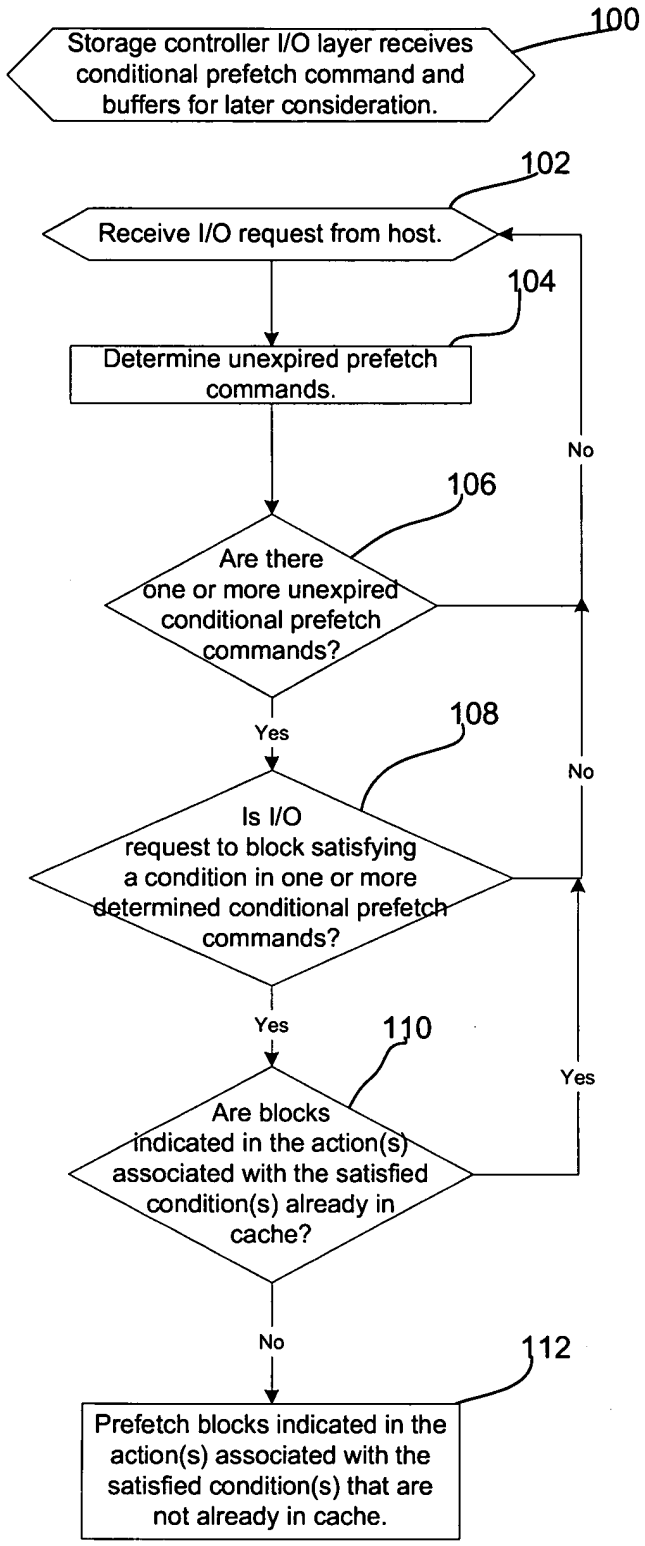
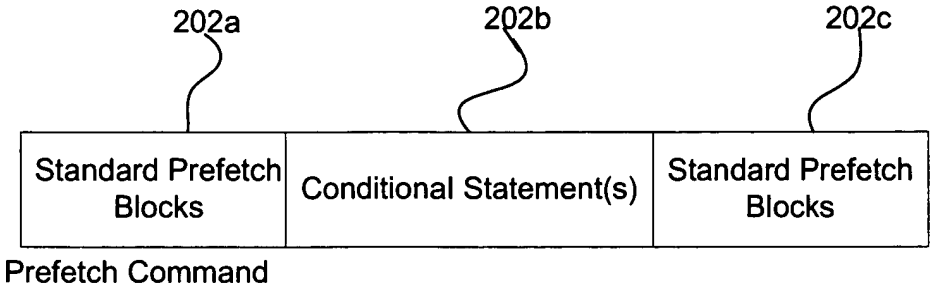
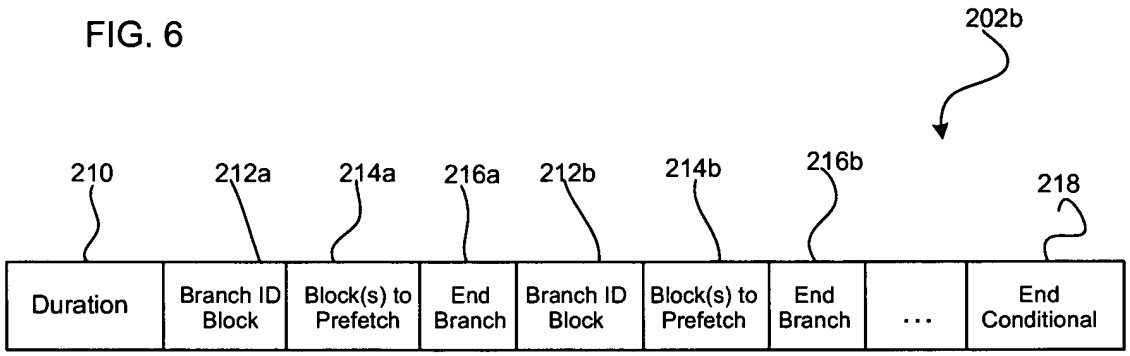

100
Storage controller I/O layer receives conditional prefetch command and buffers for later consideration.
102
Receive I/O request from host.
104
Determine unexpired prefetch commands.
106
Are there one or more unexpired conditional prefetch commands?
No
Yes
108
Is I/O request to block satisfying a condition in one or more determined conditional prefetch commands?
No
Yes
110
Are blocks indicated in the action(s) associated with the satisfied condition(s) already in cache?
Yes
No
112
Prefetch blocks indicated in the action(s) associated with the satisfied condition(s) that are not already in cache.

FIG. 5



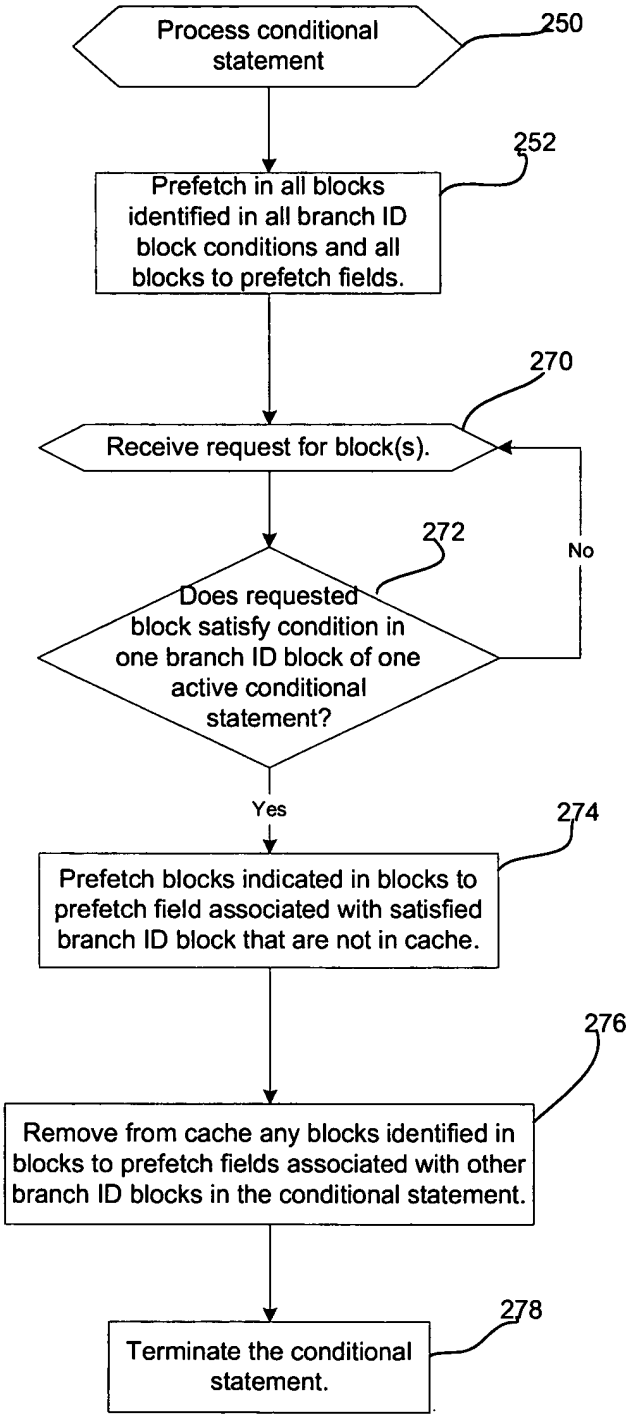
Prefetch Command

FIG. 6



Conditional Statement

FIG. 7


Process conditional statement
250
252
Prefetch in all blocks identified in all branch ID block conditions and all blocks to prefetch fields.
270
Receive request for block(s).
272
Does requested block satisfy condition in one branch ID block of one active conditional statement?
No
Yes
274
Prefetch blocks indicated in blocks to prefetch field associated with satisfied branch ID block that are not in cache.
276
Remove from cache any blocks identified in blocks to prefetch fields associated with other branch ID blocks in the conditional statement.
278
Terminate the conditional statement.